



THE CARBON SEQUESTRATION NEWSLETTER

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Sequestration in the News

DOE's Regional Sequestration Partnerships. On November 21st, Department of Energy Secretary Abraham announced a solicitation to create a nationwide network of ["regional sequestration partnerships"](#) to determine the most suitable technologies, regulations, and infrastructure needs for different areas of the country. The regional sequestration partnerships will be administered by the NETL Carbon Sequestration Program, which plans to fund 4-10 partnerships for a period of up to 24 months. Total Federal funding for this initiative will be \$8-\$10 million dollars with a non-Federal cost share of at least 20%. DOE, November 21, 2002.

The Secretary also announced a new carbon sequestration project with American Electric Power and Battelle that will examine the possibility of storing CO₂ in geologic formations deep beneath the Ohio River Valley.

IPCC Carbon Sequestration Workshop. The Intergovernmental Panel on Climate Change's (IPCC) workshop on carbon capture and storage was held in Regina, Canada. 70 delegates from 37 countries attended the week-long conference. "Scientists gather to talk carbon dioxide storage," [The Leader-Post](#), November 19, 2002. [Preprints](#) are also available.

The Millennium Project. An international think tank is exploring the idea of wireless energy transmission and carbon sequestration among options to meet growing energy demands safely and efficiently. The article mentions several sequestration strategies, including creative high-risk approaches, and more traditional approaches such as injecting CO₂ into the earth or ocean, and planting trees. The Millennium Project has been named one of the best foresight organizations by DOE. ["Millennium Project Explores Potential for Wireless Energy; Analyzes Approaches to Carbon Sequestration,"](#) American Council for the United Nations University Millennium Project, November 18, 2002.

Weyburn. An article about the Weyburn field enhanced oil recovery sequestered carbon. "Injection may be 'wey' to go," [The Calgary Sun](#), November 13, 2002.

Stanford becomes scientific hub of climate research.

\$225 million in private sector donations helps Stanford University launch the Global Climate and Energy research Project (G-CEP). CO₂ separation, capture, and storage methods is listed as one of a broad range of low GHG emission energy technologies to be developed. ExxonMobil plans to invest up to \$100 million over the next 10 years, and General Electric \$50 million. ["Stanford University to Lead Search for Solutions to Global Climate and Energy Needs,"](#) November 20, 2002.

UC Irvine research. Using a \$1.5 million particle accelerator to compare the amount of carbon-14 actually in the atmosphere to a projected amount if fossil combustion were not taking place, scientists have confirmed that the rise in GHG is due to fossil fuel combustion. "Scientists track building-block carbon to show global warming," October 26, 2002, [Orange County Register](#).

Tools for estimating GHG emissions from paper production. The International Council of Forest and Paper Associations developed methodology for estimating GHG emissions from paper operations. ["International calculation tools issued to assess greenhouse gas emissions from pulp and paper mills,"](#) ICFPA, November 28, 2002.

Ocean robots in the Indian Ocean. Cycling between the surface and a depth of two kilometres every 10 days, an array of ocean robots help scientists understand Australia's and the world's changing climate. Nearly 600 of the ocean profilers have been deployed globally with [3,000 profilers](#) due in place by 2006, ultimately forming part of a larger monitoring program. ["Ocean robots watching our climate,"](#) CSIRO, November 2002.

EOR Canadian public outreach. The next three consecutive issues of Climate Change Central's newsletter will focus on GHG technologies. The current issue covers enhanced oil recovery. Articles include an EOR technology overview and a case study of the Weyburn operation. "Sparking a Less Carbon-Intensive Future – Greenhouse Gas Technologies," [C3 Views](#), November 2002.

Integrating international global environmental research programs. The International Geosphere-Biosphere Programme (IGBP), International Human Dimensions Programme (IHDP), and World Climate Research Programme (WCRP) have established a "[Global Carbon Project](#)" (GCP) to integrate carbon research of the various programs. The GCP will deliver research results relevant to the IPCC assessment process and to the coupled human-carbon-climate system. November 2002.

Energy Policy. The U.S. National Commission on Energy Policy, a privately funded 18-member panel, will reexamine energy policy to balance energy use and environmental protection. The Commission expects to present a report in two years. One of the goals of the Commission is to make progress on the issue of combating climate change. "[New Panel will Tackle Energy Policy](#)," *MSNBC*, November 26, 2002.

Terrestrial

Fires and the carbon cycle. After analyzing the 1997 Indonesian fire, researchers from the UK and Germany found that widespread fires burned much of the forested peatlands, releasing an estimated 0.81 to 2.57 gigatonnes of carbon, or 13–40% of the mean annual global carbon emissions from fossil fuels. Lowland tropical peatlands support a peat swamp forest overlying peat deposits up to 70 feet thick. Persistent environmental change such as drainage and forest clearing makes them susceptible to fire. "The amount of carbon released from peat and forest fires in Indonesia during 1997," *Nature*, November 7, 2002.

Terrestrial impact. A recent report from the Royal Society of Britain indicates that carbon sequestration from changes in agriculture and forestry practices can potentially achieve 25% of the necessary CO₂ reductions globally in the next half-century to avoid large increases in temperature. "[Carbon copy: profitable ways to reduce emissions](#)," *Energy User News*, November 2002.

Algae adding complexity. Researchers found that floating ocean algae cause the ocean surface to darken and absorb more energy from the sun. According to the article, this counteracts climate benefits from absorbed atmospheric CO₂. The research is reported in the November *Journal of Geophysical Research*, and NASA, DOE, and the California Space Institute supported the research. "[Microscopic algae may heat up oceans](#)," *San Francisco Chronicle*, November 12, 2002.

Grasslands sequester large amounts of carbon. Reports from an 11-state Agricultural Research Service CO₂ monitoring network in the central and western U.S. show that the 126 million acres of grassland in the Great Plains could be storing 9 million tons of carbon annually, and U.S. rangeland soils have the potential to store a total of 30 to 110 million tons of carbon a year, 5 percent of the annual U.S. carbon emissions. Rangeland, about half the Earth's land surface, has an advantage over forests for carbon storage because most of the carbon is stored under ground, protected from fire. "[Is the mystery carbon hidden under grass?](#)" *M2 Presswire*, October 30, 2002.

Soil carbon in the market. A piece on Voice of America summarized issues of soil carbon sequestration. A variety of tillage practices, winter cover crops and other practices can create a gradual carbon sink into the soil. The U.S. Department of Agriculture estimates an additional \$300 million per year could go to American farmers. Research on measurement and verification technologies will allow accurate documentation of agricultural carbon sequestration. "[Carbon Sequestration in Farming Could Offset Carbon Dioxide Emissions](#)," *VOA* November 13, 2002.

Land-use Change Flux Update. DOE's Carbon Dioxide Information Analysis Center (CDIAC) has updated "Carbon Flux to the Atmosphere from Land-Use Changes" with estimates from 1850 through 2000 for nine regions of the world. "[CDIAC Updates Carbon Flux Estimates from Land Use Changes](#)," CDIAC, November 2002.

Sudan soil carbon potential. Researchers find that increasing fallow periods in Sudan results in increased soil carbon content, and converting marginal agricultural areas to rangeland will restore the carbon levels to 80% of the natural savannah carbon levels in 100 years. Potentially important synergies between the Convention on Climate Change, the UN Convention to Combat Desertification and the UN Convention on Biodiversity are explored. "Soil carbon sequestration on degraded semiarid agro-ecosystems; perils and potentials" *Ambio*, November, 2002.

Carbon Trading

The Biocarbon Fund. A public/private partnership launched by the World Bank will provide funds for offset projects that reduce GHGs, promote biodiversity, and encourage sustainable development, including projects not covered in the Kyoto Protocol such as conserving or restoring existing forest. Fourteen businesses, from power utilities to insurance companies, indicate interest in participating. "[Launch of US\\$100 Million Biocarbon Fund](#)," The World Bank, November 5, 2002.

Experimental Trading regime in Japan. The Japanese Environment Ministry will test-run a regional GHG market starting January 2003, involving roughly 30 firms. A full-fledged national market will be established in 2005 or later. The firms will set their own maximum emission levels for a year. "[Japan to test-run greenhouse-gas emission market in January](#)," *Kyodo News*, November 17, 2002.

Sequestration in the News, Cont'd

German trading simulation. Twelve companies from Baden-Württemberg in Germany participated in an emissions trading simulation. A summary of the project with conclusions is available. "[Simulating emissions trading](#)," Fraunhofer Institute.

Rainforest emissions offset project. Conservation International and an Ecuadorian conservation organization will reforest 680 acres of degraded pastureland in northwest Ecuador. The Oregon Climate Trust provided \$186,000 for the project. "[Oregon Power Companies Offset Carbon Through Investment in Ecuador's Rainforest](#)," *CSRwire*, November 20, 2002.

Australian and U.S. GHG trades. BP and Australian waste-to-energy operator Global Renewables traded 1.05 million tons of GHG abatement over a three to five-year period with an option for a further 50,000 tons. "[BP buys Eastern Creek credits](#)," *Sydney Morning Herald*, November 6 2002. In the U.S., chemical company Dupont made a demonstration trade to utility Entergy Corp. "[Greenhouse trade needs US mandate to grow – Entergy](#)," *Reuters*, November 4, 2002,

Events and Announcements

Regional Partnership solicitation. The Carbon Sequestration Program will fund 4 to 10 Regional Partnerships to determine suitable carbon gas capture and storage technologies, regulations, and infrastructures in a particular U.S. region. Program Solicitation DE-PS26-03NT41713, "[Regional Carbon Sequestration Partnerships - Phase I](#)".

Two DOE Solicitations. The Department of Energy Small Business Innovation Research will select 200 Phase I grant applications for up to \$100,000 over a period of six to nine months. The DOE Office of Science will make approximately \$400 million available for grants in basic energy, biological and environmental sciences in FY 2003. [Small Business Innovation Research. Office of Science Financial Assistance Program --Notice 03-01](#).

Voluntary GHG Reporting Rules. The Departments of Energy and Agriculture, and the Environmental Protection Agency announce the first series of workshops to enable interested persons to help improve the guidelines for the Department of Energy's Voluntary Greenhouse Gas Reporting Program and related programs. Please note that you must register 3 weeks in advance. Dates and locations for the workshops organized by DOE: Chicago, IL, December 5-6, 2002; San Francisco, CA, December 9-10, 2002; Houston, TX, December 12-13, 2002. Dates and locations for the workshops organized by USDA: Agriculture Accounting Rules and Guidelines, January 14-15, 2003 and Forest Accounting Rules and Guidelines, January 23, 2003. [DOE](#) and [USDA](#).

The American Geophysical Union Fall Meeting will be held December 6-10 in San Francisco. A special session entitled "Carbon Sinks and Carbon Management: Scientific Perspectives on Potential Benefits and Consequences" will be convened as part of the conference. The [conference](#) code for this session is U08.

Carbon Finance 2003 will be held in London January 23 and 24. Arranged by [Environmental Finance](#).

A European CO₂ Capture and Storage Seminar entitled '[FP6: opportunities for CO₂ capture and storage](#)' will be held in London, UK on January 8 2003 with the support of the Research DG of the European Commission, Technology Initiatives Ltd, as the coordinator of CO2NET.

Electric Utilities Environmental Conference. The 6th Annual Conference on Air Quality & Global Climate Change will be held January 27-30, 2003, in Tucson, Arizona. The conference will cover policy, trading, voluntary programs, and science and technology options, including carbon sequestration. DOE is one of the conference sponsors, along with EPA, EEI, EPRI, and A&WMA. For more information, please visit www.euec.com.

NETL at the February AAAS Meetings. Carbon Sequestration is on the agenda at The American Association for the Advancement of Science annual meeting, which will be held February 13-18, 2003, in Denver, Colorado. NETL has organized two symposia, "Comparative Assessment: Carbon Sequestration as a Greenhouse Gas Mitigation Strategy" and "Climate Change Mitigation Strategy: Technical Challenges for Carbon Sequestration," which will be included in the Dealing with Global Change track on Monday, February 17, 2003. <http://www.aaas.org/meetings/>.

The Earth Technologies Forum, which addresses global climate change and ozone protection announces that it is accepting abstracts for papers to be delivered at its April 22-24, 2003 conference in Washington, DC.

Abstract request: NETL's Second National Conference on Carbon Sequestration, [Developing and Validating the Technology Base to Reduce Carbon Intensity](#) will be held May 5-8, 2003 in Alexandria, VA. The First National Conference was held May 2001 and was attended by over 400 national and international experts from government, academia, and industry. You are invited to submit a paper proposal that builds on what was presented at the 2001 Conference, or breaks new ground. The Steering Committee and National Energy Technology Laboratory staff will be looking for innovative ideas, as well as progress reports on development of carbon sequestration strategies to meet the national goal of an 18% reduction in carbon intensity. Guidelines for abstracts: Submit a 100 word abstract via e-mail to carbonsq@exchangemonitor.com, by Feb. 7, 2003.

Events and Announcements, Cont'd

Petroleum Geologist Convention. The next annual convention of the American Association of Petroleum Geologists (AAPG) entitled "[Energy: Our Monumental Task](#)" will be in Salt Lake City, Utah, on May 11-14, 2003. A special session on "Geological Sequestration of CO₂" has been arranged. Click on session O-22.

12th International Conference on Coal Science, at the Cairns Convention Centre, Australia, November 2nd – 6th 2003. Hosted by the Australian Institute of Energy, the International Energy Agency & IEA Clean Coal Centre. Abstracts are due February 1st 2003, e-mailed to iccs@aie.org.au. Topics covered include global warming, greenhouse gas emissions, CO₂ mitigation and sequestration.

Recent Publications

New Information from NETL:

[Regulatory Barriers for Carbon Capture, Storage and Sequestration](#), November 12, 2002.

[Lessons Learned from Natural and Industrial Analogues for Storage of Carbon Dioxide in Deep Geological Formations](#). [12.8 MB, 227 pages].

[GHG Facts](#) to provide you with basic information on greenhouse gas issues, November 4, 2002.

A new TechLine "[A Greenhouse Gas Solution Deep Beneath Our Feet?](#)" November 13, 2002.

NETL's Five Year Institutional Plan. The U.S. Department of Energy, Office of Fossil Energy, National Energy Technology Laboratory has released their Institutional Plan for FY 2003-2007. Section 3.6, Carbon Sequestration: Important Options and Sensible Approaches to Address Climate Change, covers the Program's goals and actions. [Institutional Plan](#), NETL, November 15, 2002.

The United States Global Change Research Program Plan. A broad four year research agenda on global warming focuses on the science of understanding climate systems. The Program will also review the potential role of developing and recently-developed technologies in reducing net GHG emissions, including considerations of costs, effectiveness, and both intended and unintended consequences of engineered technologies for sequestering GHG emissions. "[Government Outlines Plan for Research on Warming](#)," *The New York Times*, November 13, 2002, and the [draft](#) document.

U.S. regional actions on climate mitigation. A publication released by the Pew Center presents case studies of nine states - Georgia, Massachusetts, Minnesota, Nebraska, New Jersey, North Carolina, Oregon, Texas, and Wisconsin - that have taken action to mitigate climate change. "[Greenhouse & Statehouse: The Evolving State Government Role in Climate Change](#)," Pew Center on Climate Change, November 2002. Also the Pew [searchable database](#) of state activities has 14 new case studies, covering 7 states.

Canada's climate change plan. The Government of Canada released its Climate Change Plan. Emissions trading for large industrial emitters, increased investment in innovative technologies, and taxes are included in the plan. "[Release of Canada's Climate Change Plan](#)," Ottawa, November 20, 2002.

GAO air pollution report (GAO-03-49) on future power plant generation and impacts on emissions of four pollutant substances, carbon, mercury, NO_x and SO_x. It was prepared for the Senate Environment and Public Works Committee using EIA data. "Air Pollution: Meeting Future Electricity Demand Will Increase Emissions of Some Harmful Substances," [GAO](#), October 30.

Smart growth and GHG reduction. A new National Governors Association Center for Best Practices report emphasizes expanding transportation choices, conserving greenspaces, and promoting new community designs. Successful state initiatives, such as Wisconsin's GHG emission reduction strategy and Vermont's Greenhouse Gas Action Plan, are highlighted. "[Growing with Less Greenhouse Gases](#)," NGA, December 2002.

Climate Policy Journal. Articles concerning emissions trading and carbon sequestration in agroforestry, U.S. policy, and Kyoto ratification are included. [Climate Policy](#), December 2002.

IEA member country actions. A new volume reviews over 200 energy-related policies and measures taken by 26 IEA Member countries to tackle climate change. "[Dealing with Climate Change: Policies and Measures in IEA Countries](#)," OECD, November 2002.

Survey of the science and energy policy choices of climate change. A report by the OECD and IEA assesses the science, technology, current commitments, technical change, burden-sharing and possible forms of future commitments for climate change mitigation. A chapter on carbon capture and storage potential is included. "[Beyond Kyoto: Energy Dynamics and Climate Stabilization](#)," OECD, November 2002.

Recent Publications Cont'd

GHG market risks. A new report quantifies the risks to participants in emerging GHG emission markets and prospective users of the Kyoto mechanisms. "[Quantifying risks and risk correlation of investment in climate change mitigation](#)," University of St. Gallen, November 2002.

Ton-year accounting and effective terrestrial measures. An article by UK and Finnish researchers illustrates that a ton-year approach to sequestration can be ineffective in long-term climate stabilization. They also show that the use of bioenergy from reforested areas to replace fossil fuels can control CO₂ concentrations more effectively than permanent sequestration in forests. "The role of carbon sequestration and the tonne-year approach in fulfilling the objective of climate convention," [Environmental Science and Policy](#), December 2002.

An international consensus for GHG trades. A paper in Energy Policy examines five possible approaches for valuing energy savings, which could serve as the basis for an international GHG trading agreement. "International Greenhouse Gas Trading Programs: A Discussion of Measurement and Accounting Issues," [Energy Policy](#), February 2003.

Climate protection treaties. In a book from the Climate of Trust Project and the World Resources Institute, seventeen contributors from nine countries offer analyses of options for strengthening the climate protection treaties, especially designing solutions to include both developed and developing countries. Terrestrial sequestration is mentioned as part of a portfolio of mitigation options. "[Building on the Kyoto Protocol: Options for Protecting the Climate](#)," Climate of Trust Project and WRI, October 2002.

Legislative Activity

Legislation in the 107th Congress related to global climate change. A list of [85 legislative proposals](#) introduced in the 107th Congress related to global climate change. Pew Center, October 23, 2002.

International Legislative Activity

New Zealand's Initial Carbon Legislation. Preliminary legislation to set up a carbon trading system in New Zealand will exempt agriculture in the first commitment period, provided farmers start research to reduce agricultural emissions. 55% of New Zealand's estimated emissions are from agriculture operations. Large carbon-emitting companies such as New Zealand Steel will be able to opt out of all or part of the emissions charge. "[Climate Change Response Bill 2002](#)," *New Zealand Herald*, November 15, 2002.

New South Wales Energy Providers Face Mandatory GHG Limits. Australia's New South Wales Government tightened legislation, requiring energy providers to reduce GHG emissions or invest in offset projects within New South Wales only. The legislation comes into force on January 1, and calls for power companies to reduce emissions 5 percent below 1990 levels by 2007, and maintain those levels for a further five years. "No Green Credit Across The Border," [Sydney Morning Herald](#) November 21, 2002.

Large Point Sources of CO₂ Targeted in Tokyo. 1,000 factories and offices in Tokyo, emitting a total of 10 million tons of CO₂ annually, may soon be required to curb CO₂ emissions. The metropolitan government will establish an advisory panel to set emission-reduction targets and disciplinary measures for businesses that fail to meet obligations. "[Tokyo to make CO₂ cuts mandatory for major firms](#)," *The Asahi Shimbun*, November 14, 2002.

Kyoto Ratification. New Zealand recently passed a Climate Change Response Bill, and intends to follow through with Kyoto Protocol ratification. South Korea has already handed in the Kyoto Protocol instrument of ratification to the UNFCCC (South Korea is not among the 38 developed countries that agreed to limit their GHG emissions, but will likely be obligated to make reductions between 2013 and 2017). Both Canada and Russia are still uncertain, though Chretien announced at August's Earth Summit in Johannesburg that his government will ratify Kyoto before the end of the year, and Russia has announced it will take another year to consider ratification. "New Zealand to ratify Kyoto Protocol in weeks," *New Zealand Herald*, November 14, 2002. "Korea Sends ratification of the Kyoto pact to UN," [JoongAng Ilbo](#) November 12, 2002. "Chretien vows to stop talking and ratify Kyoto," [Inter Press Service](#), November 28, 2002.

This newsletter is produced by the National Energy Technology Laboratory and presents summaries of significant events related to carbon sequestration that have taken place over the past month.

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